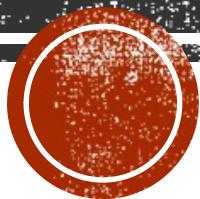
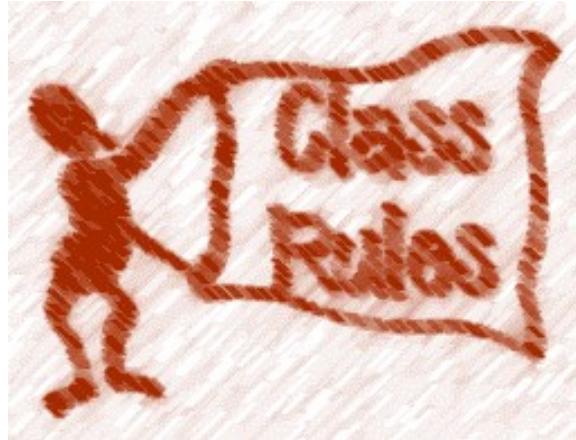


**Mashegoane**





- Communicate with the lecturer at all times.
- Prepare in advance in order to improve your understanding.
- The lecturer's slides do not replace the text.
- Develop and keep your notes. Always refresh your memory by frequently going through the summary of the lesson.



# A NOTE ON THE (SUB)MODULE:

- Although the textbook selected for use has its own examples, the research methodology module will use examples selected by the lecturer.



# LESSON PLAN

**▪(SUB)MODULE TITLE: Research Methodology**

**▪MODULE CODE: HPSY011**

**▪SUBJECT AREA:**

▪Psychology, basic statistics

**▪OBJECTIVES: At the end of this module, students will be able to:**

▪Describe the concept research methodology

▪Describe the main types of research approach

▪Explain the steps of a research process

▪Understand the process of planning and executing a research



- **TIME FRAME:**
- Five class periods
- Breakdown
  - 1: Introduction, to Step 1: Planning (Selecting a research topic)
  - 2: Step 2: Research methods (Identifying an appropriate research approach);
  - 3 Step 3: Data collection
  - 4: Step 4: Analysis of data (I. Analysis of quantitative data & II. Analysis of qualitative data);
  - 5: Step 5: Report findings (Presenting the meaning of the findings);
  - 5: Step 6: Theory building (Data driven confirmation or reformulation of theory)
  - 6: Test



# LESSON PLAN CONTINUED...

- **PREREQUISITE KNOWLEDGE:**

- Basic computational skills.

- **MATERIALS NEEDED:**

- Internet connectivity.

- **PROCEDURE:**

- Students are required to familiarize themselves with the questionnaire before learning the steps of the research process. Ideally, they should complete the questionnaire to acquire a feel of being research respondent or participant.
  - Students must do the exercise provided in class.

- **ASSESSMENT:**

- Students will be assessed at the end of the module.



# ***Definition of Research Methodology***

- It is the scientific study of how research is conducted.
- The concept “methodology” is commonly used to refer to how something is done, or the steps of doing it.
- Thus, when studying research methodology, the student familiarizes themselves with the various steps normally used to study a research problem, together with the underlying reasons for doing so.
- **Research methodology is the way in which research problems are solved systematically.**



- Research methodology involves the use of research methods or techniques to conduct research methodically.
- Therefore, research methods or techniques are elements of research methodology.
- Contrast Research methodology with Research methods
  - **Research methodology is the science, and research methods are the particular techniques used to conduct research.**



# MAIN APPROACHES TO RESEARCH

- A researcher follows different steps in conducting research.

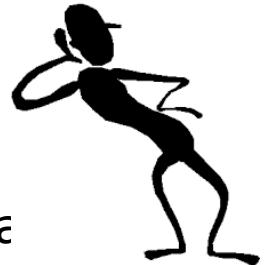


- The two main approaches followed to conduct research are:
  - The quantitative approach, and the
  - the qualitative approach



- **Contrasting the qualitative and the quantitative approaches:**
- Researchers reach conclusions on the basis of data
- Therefore research is empirical.
- Empirical is an adjective used to describe that something is concerned with, or verifiable by experience or observation rather than theory or pure logic.
- There are two types of empirical research, namely:
  - qualitative and the quantitative





- Qualitative research produces textual data
  - Textual data requires narrative descriptions in its analysis



- Quantitative research produces quantifiable data
  - Quantifiable data requires statistical analysis

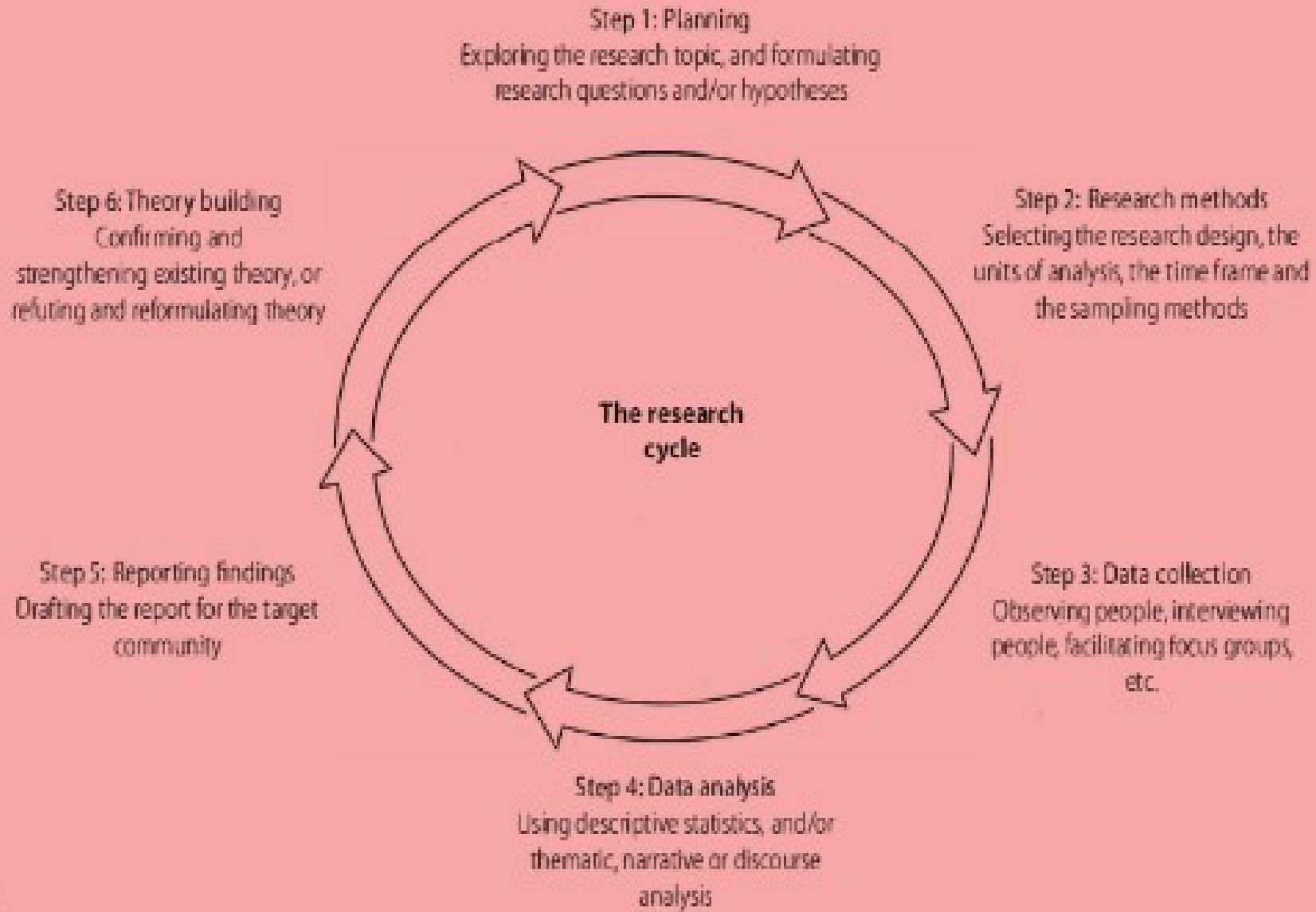
- Thus there are qualitative research methods, and quantitative research methods



# STEPS OF THE RESEARCH PROCESS

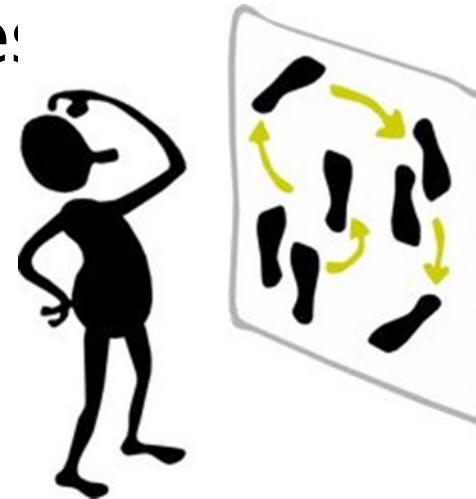
- **Step 1: Planning**
  - Selecting a research topic
- **Step 2: Research methods**
  - Identifying an appropriate research approach
- **Step 3: Data collection**
  - Collecting relevant information for the study
- **Step 4: Analysis of data**
  - Analysis of quantitative data
- **Step 5: Reporting findings**
  - Presenting the meaning of the findings
- **Step 6: Theory building**
  - Data driven confirmation or reformulation of theory





# STEP 1: PLANNING SELECTING A RESEARCH TOPIC

- A topic must reflect the researcher's concerns and objective:



- For instance, refutation of existing theory, or
- Simply, replication of another study



- **Literature Review:**

- Identification of a topic is followed by a thorough review of relevant literature.
- Reason: Literature review may provide the reason(s) for conducting a study
- Sources: Journal articles, books
- Method: Search engines; open internet must be used with caution



- In times of the coronavirus, it is natural that research focus for socially responsible researchers will be spread of the virus and its various consequences.
- Most journals have dedicated issues to coronavirus research, and have made the journals freely available.
- Popular magazines and newspapers cover the topic.
- Books take longer to appear.



- Formulating the research problem and posing the research questions
- The research problem posed must be researchable
- For instance, it must be quantifiable (quantitative research), or
- Sharable/disclosable (qualitative research)



# QUICK EXERCISE.

- There is no point in asking a question that you as a psychologist may not be able to answer.
- A nursing student has limitations to what can be accessed.
- Similarly, a social work student has access to almost all patients, but it is under special circumstances.
- Explore the limits and possibilities of what you can and cannot research within your discipline.



# CLASS TASK 1

- Task

- Briefly describe what qualitative research is.
- Briefly describe what quantitative research is.
- What is the difference between research methods and research methodology.
- Formulate a research topic on coronavirus (Novel Coronavirus; 2019-nCoV; or SARS-CoV-2):
  - Familiarisation with an aspect of the steps of research to be covered.
  - The topic can be either be qualitative or quantitative
- .

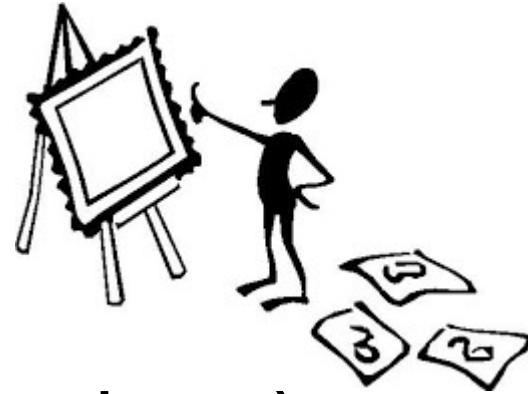


# STEP 2: RESEARCH METHODS

## IDENTIFYING AN APPROPRIATE RESEARCH APPROACH

- Types of research studies
  - exploratory study: explore
  - descriptive study: describe
  - explanatory study: explain





- Types of research design (the how)
- Quantitative research design:
  - e.g., cross-sectional (associations) and experimental (causal) design
- Qualitative research design:
  - e.g., case study and phenomenological design



- **Using variables in the design of a quantitative research study**
- **Definition:** A variable is a property of an individual that could vary.
- **Types:** Independent variables (IV)[predictor]  
Dependent variables (DV) [outcome]



# QUICK EXERCISE.

- Identify variables you can study within the context of the coronavirus epidemic.



# ASPECTS TO BE THOUGHT THROUGH AND INCORPORATED WHEN PLANNING A STUDY

- Units of analysis
  - The primary entity that is the focus of a study
  - E.g., individual, group
- Hypothesi(e)s
  - A tentatively suggested answer to a research question;
  - To be proved to be true (accepted) or false (rejected)
- Time frame
  - Cross-sectional: data collected at one point only
  - Longitudinal: data collected over a period of time



## ▪ **Sampling**

- When the units to be studied are small in quantity, it is possible to collect information from all of them
- When they are many, information is collected from a representative sample drawn from the total population



- **Population parameters, sample statistics and statistical inference** (p. 25, last paragraph of the text)
- *“Specific information that relates to a population is called a population parameter. Similarly, information that relates to a sample or representative group of people from the population of interest is called a sample statistic. Most often, population parameters are unknown because researchers are unlikely to be able to get information from every single person who is able to provide that information. Therefore, conclusions about population parameters are made on the basis of sample statistics.*
- *The practice of generalising findings from a sample to a population is called statistical inference. ”*



- **The sampling frame**
- It is a complete list of the population of a particular study.
- **Types of sampling**
  - probability sampling, and non-probability sampling.
- **Probability sampling:**
- Definition: every unit of analysis in a population has an equal chance of being selected into a sample
- Examples: Simple random, interval, stratified random and multi-stage sampling.



- **Non-probability sampling:**
- Definition: There is no concern with sample representativeness, since results will not be generalised to the population.
- Examples: Convenience/accidental, purposive sampling and snowball sampling.



- How many is enough?
- Quantitative study: Sample size depends on the size of the population; or the type of statistical analysis to be conducted.
- Qualitative study: Sampling is done until a point of saturation.

- **Page 27 of the prescribed text:**
- *“... for both qualitative and quantitative researchers, there is no definitive answer to the question: "How big is big enough?" Deciding on a sample size will depend on the level of accuracy a researcher requires, the degree of diversity within the population of interest, and the amount and quality of data gathered.”*

# STEP 3: DATA COLLECTION

## COLLECTING RELEVANT INFORMATION FOR THE STUDY

- Levels of measurement
- **Nominal scales**
- Purpose: classification of variables into mutually exclusive categories and assigning them labels in the form of numbers.
- Examples: male (=1) and female (= 2); young (=1), middle-aged (= 2) and old (= 3); happy (=1) and sad (= 2).



- **Ordinal scales**
- Purpose: assigning labels to variables in the form of numbers such that one variable can be placed in relation to another in terms of the amount of the relevant attribute that they possess.
- Example: examination marks - E (0-40%) = fail; D (40-50%) = unsatisfactory; C (50-60%) = satisfactory; B (60-70%) = good, and A (70%+) = excellent.
- *“The numbers assigned are not only mutually exclusive labels of examination attainment, but can also indicate that a score of 1 is worse than a score of 2, or that a score of 2 is better than a score of 1.”*



- **Interval scales**
- Purpose: In an interval scale the assigned numbers have equal intervals, although there is no zero point.
- Example: IQ, emotional stability.
- *“Most measures in the behavioural sciences are interval measures.”*



- Ratio scales
- Like interval scales, but superior because they have a true zero



# METHODS FOR GATHERING DATA



- **Observation**
- Non-participant observation involves a researcher observing people without interacting with them.
- Participant observation entails becoming part of a group, and covertly observe its behaviour during interactions.
- 



## ▪ **Interviews**

- Definition: Interviewing is a process of gathering information for research using verbal interaction.
- Types:
  - Structured interview: the interviewer follows a set list of questions in a certain sequence.
  - Unstructured interview (an open-ended interview): The researcher merely tries to remain focused on an issue of study and uses few pre-determined questions, if any. The format is appropriate when the aim is to gain insight into the participant's interpretation of his/her experiences.
  - Semi-structured interview: the researcher ensures that certain areas of questioning are covered but there is no fixed sequence or format of questions.



- **Questionnaires**
- Description: A questionnaire is a text that asks specific questions in a specific order.
- Types:
  - Administered questionnaires: Completed by participants in the presence of the researcher.
  - Self-administered questionnaires: Completed by participants without the presence of the researcher.
  - Medium: Paper-and-pencil; electronic



- **Focus group interviews:**
- Basically entail a group discussion, facilitated by a moderator, that explores a particular topic selected by the researcher.
- **Other methods of gathering data:**
  - Documents analysis
  - Analysis of audio



# STEP 4: ANALYSIS OF DATA

## I. ANALYSIS OF QUANTITATIVE DATA

- Entering data into a database
- After collecting data, responses are assigned numbers.
- The numbers are then captured in a computer, and subjected to statistical analysis.
- Prior to analysis, data is checked for capturing errors, and, where necessary, the error in the questionnaire is corrected.
- Analysis is conducted after data has been cleaned.



# METHODS OF INSPECTING PATTERNS OF SCORES IN A DATA SET

- **Basic type of data analysis**
- Descriptive data analysis:
- A descriptive data analysis describes data by examining the distribution of scores for each variable.
- Scores can be examined visually on a frequency distribution



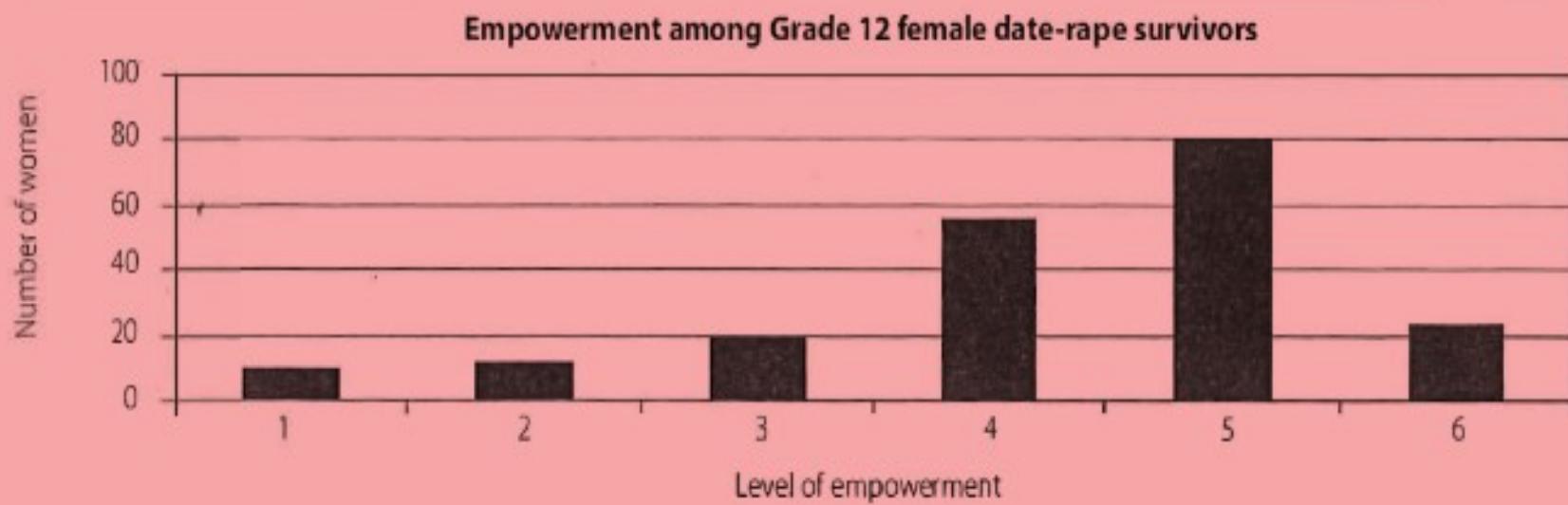


Figure 2.3 The frequency distribution of empowerment among Grade 12 female date-rape survivors

- Extract from page 31 of the text:
- *“The researcher would need to conduct statistical analyses before being able to claim that the difference in empowerment among these two groups of women is a statistically significant finding.”*



## Mean, Median, Mode, & Range

~~5, 7, 7, 9, 11, 12, 14~~

$$\text{Mean} = \frac{\text{Sum}}{n} \quad \text{Mode} = 7$$

$$\text{Range} = 14 - 5 \quad \text{Median} = 9$$

### ▪ **Measures of central tendency**

- Definition: They each provide a researcher with a single numerical value, particularly the typical value, that represents all the values of a given variable in the dataset.
- Examples:
  - Mode: the most commonly occurring score in a distribution.
  - Median: the middlemost score when the scores are ordered from lowest to highest.
  - Mean: the average score. The exact midpoint.



## Mean

The average value

How to find the Mean:

1. Add up all the numbers.
2. Divide the sum by the number of values.

E.g. The mean of 3,2,10,5 is

$$\frac{3+2+10+5}{4} = \frac{20}{4} = 5$$

## Median

The middle number

How to find the Median:

1. Put the numbers from smallest to largest.
2. The number in the middle is the median. If there are two middle numbers, add them and divide by two.

## Mode

The most frequent number

Special Cases:

- **No Mode** if all the numbers occur the same amount of times.
- **More than one Mode** if more than one number is the most frequent.

## Range

Difference between highest and lowest numbers

How to find the Range:

1. Put the numbers from smallest to largest.
2. Subtract the lowest value from the largest.



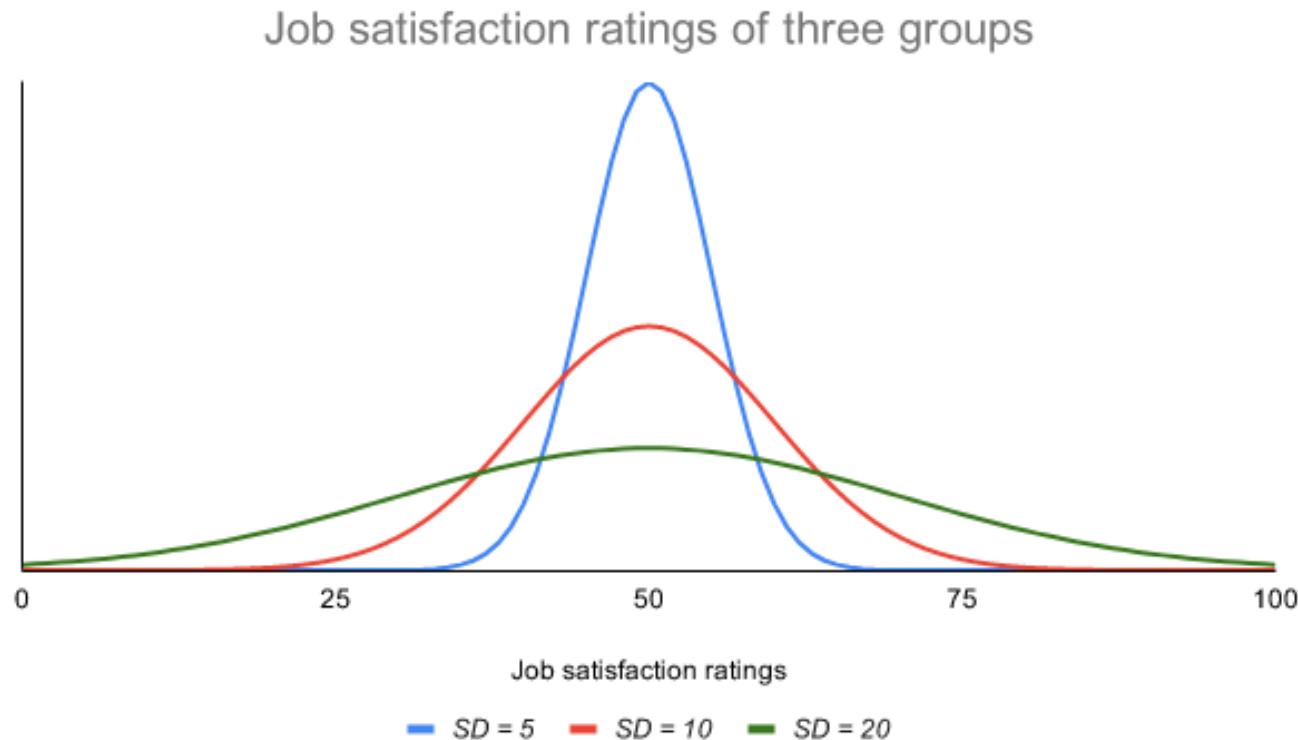
- Measures of variability:
- They provide an indication of how variable or diverse the spread of scores are.



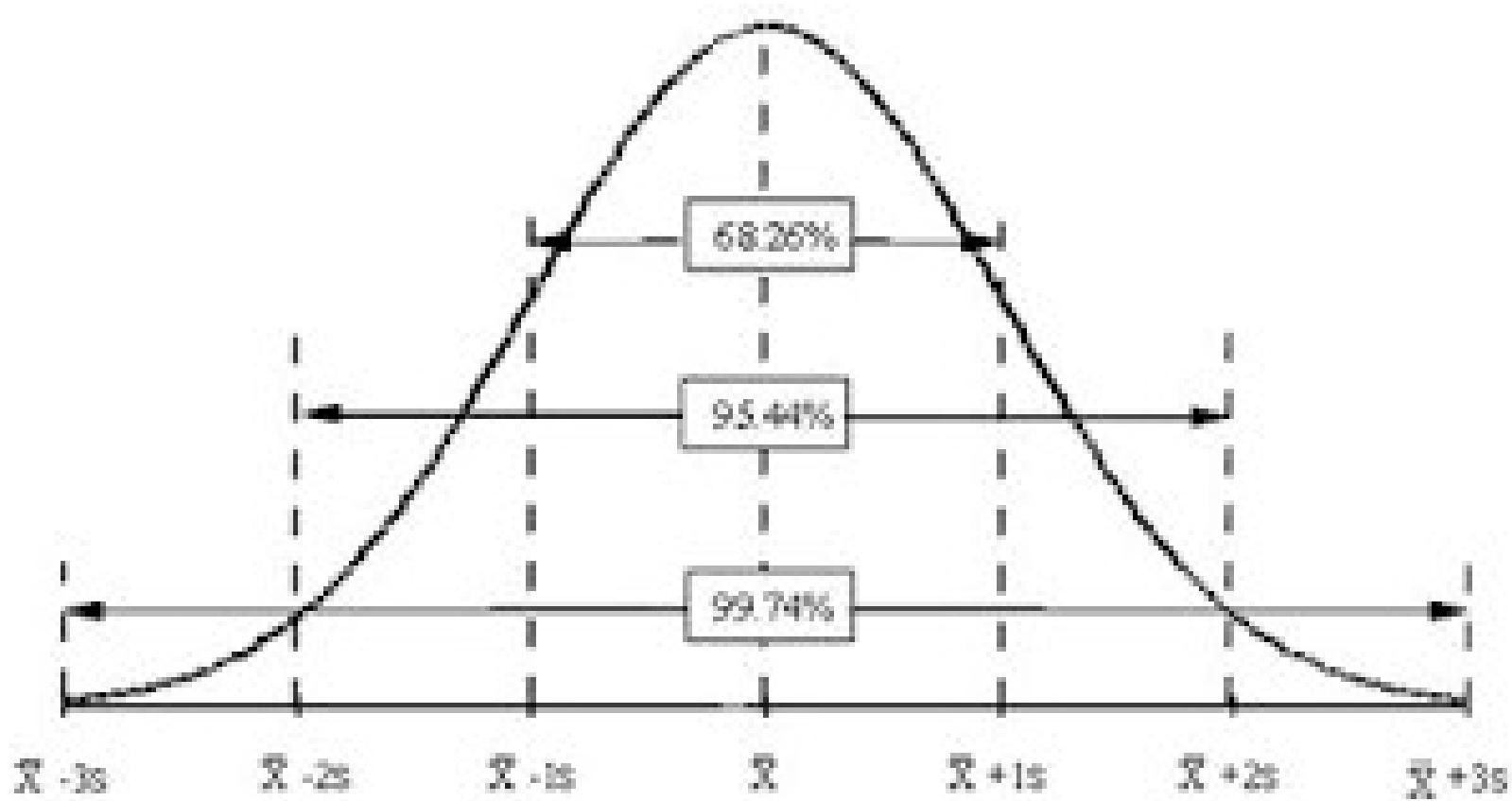
- **Types of measures of variability:**
- the range: the difference between the highest and lowest number.
- the variance: the average of the squared differences from the Mean (variance measures variability from the average or Mean.)
- Formula for the variance ()
- the standard deviation: indicates, on average, how far each value lies from the Mean; or
- based on the calculations/formulae, the square-root of the variance.
- Formula for the standard deviation (SD):



- $SD$  = in simpler terms, (since the  $SD$  reflects the dispersion of the distribution) it is a number used to tell how measurements for a group are spread out from the average:



# NORMAL DISTRIBUTION



# STEP 4: ANALYSIS OF DATA

## II. ANALYSIS OF QUALITATIVE DATA

- Transcription of data
  - Audio recording must be transcribed to text, word for word.
  - Transcripts are the basic materials used for analysis.
- Types of qualitative data analysis methods
  - thematic analysis: themes are created by identifying groups of common units in a transcript.
  - narrative analysis: a “plot” or how an individual makes sense of their reality is extrapolated from a narrative.
  - discourse analysis: explores how sets of meaning emerge from the structure of language.



- Verification of qualitative data
  - Correspondence check techniques: checking the correspondence of one's analysis to that conducted by colleagues
  - Verifying the correctness of the analysis with the respondents.
  - Consideration of alternative interpretations.



# STEP 5: REPORTING FINDINGS

## PRESENTING THE MEANING OF THE FINDINGS

- It is important to ensure that the results that are analysed and reported were not influenced by error and bias.
- Measurement error in quantitative data refers to data that can be described as inaccurate or wrong.
- Where error and bias occur, it is important to make every effort to identify, reduce, and/or compensate for them.



- Two types of measurement error in quantitative data:
- constant errors: errors influencing all the data
- random errors: errors occurring occasionally and/or due to particular assessment conditions

- Various types of bias:
  - Participant bias
  - Interviewer bias
  - Researcher bias
  - Analyst bias



- The issue of objectivity and reflexivity



## ▪ Research reports

- The organisation of a research report
  - The way in which one structures a report will depend on the audience for which it is intended.



- Format of a report:
- The introduction of a research report
  - *“The purpose of the introduction is to give the reader a clear idea about what is known about the research topic, what is unclear or unknown, and what and how the study will add to the relevant field.”*
- The method of a research report
  - *“The researcher must say how participants were recruited into the sample, what instructions were given to them, how the setting was arranged, how long the activities took, and how ethical issues such as informed consent were addressed. Finally, the process whereby the data was analysed should be provided in detail.”*



- The discussion of a research report
- The references of a research report
  - All references are reported.
  - Psychological reports use the APA publication manual 7<sup>th</sup> edition
- The abstract, executive summary and appendices of a research report

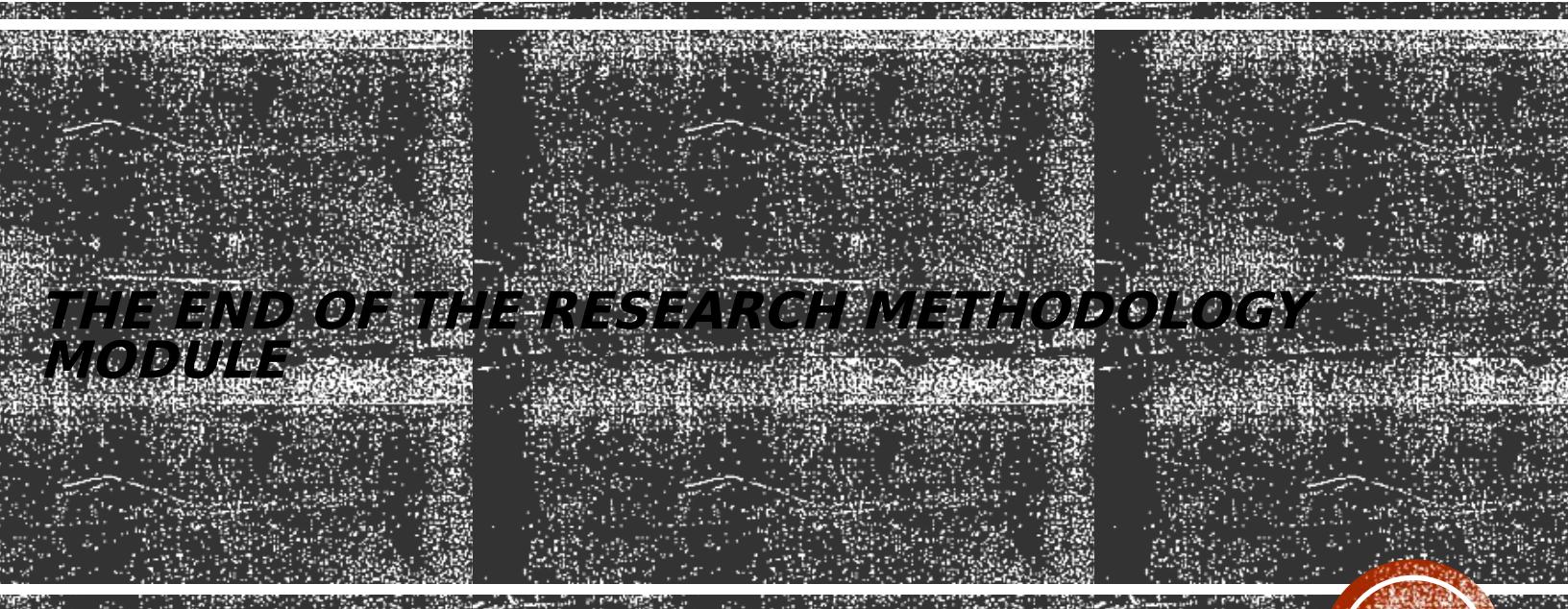


# STEP 6: THEORY BUILDING

## DATA DRIVEN CONFIRMATION OR REFORMULATION OF THEORY

- “The findings from a research study will either confirm or refute the theory that provided the explanatory frame work for the research.”





***THE END OF THE RESEARCH METHODOLOGY  
MODULE***

